

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

REMARKS/ARGUMENTS

After entry of this amendment claims 27-31, 33-38, 40, and 42-47 will be pending in this application. Claims 27, 38, and 42 have been amended. Claim 32 has been cancelled. Claims 45-47 have been added. Figure 4 has been amended. A typographical error in the specification describing Figure 4 has been corrected. Support for the new claims, and amended claims, figure, and specification can be found in the specification, no new matter has been added.

Claims 27, 29-31, 33-36, 38, and 40 stand rejected under 35 U.S.C. 102(e) as being anticipated by Yuki et al., United States patent number 5,466,957. Claims 28 and 31 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Yuki in view of Sanchez, United States patent number 5,583,067. Claim 32 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Yuki in view of Gilgen et al., United States patent number 5,134,085. Claims 35, 36, 38, 40, and 42 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al., United States patent number 5,492,847 in view of Sanchez. Claims 37 and 44 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kao and Sanchez in view of Gilgen. Reconsideration of these rejections and allowance of all the pending claims in light of these remarks and amendments is respectfully requested.

Drawings

The drawings stand objected to, specifically for not showing an enhancement implant and pocket implant in the same drawing. (See pending office action, page 2, paragraph 1.) Figure 4 has been amended to show an enhancement implant 130 and well 140 as described in the specification, for example in the pending application on page 7, lines 7-18.

Figure 3 remains unchanged, but is now on a separate sheet from Figure 4. Accordingly, a substitute sheet has been provided for both Figures 3 and 4.

Claim 27

Claim 27 stands rejected under 35 U.S.C. 102(e) as being anticipated by Yuki et al. (Yuki.) But Yuki does not teach each and every element of this claim. For example, claim

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

27 as amended recites: "wherein the implanting the field implant, the well implant, and the enhancement implant are done using a single mask." Yuki does not provide this feature.

Rather, Yuki does not define the boundary of the well. For example, Figure 1A shows a Boron implant that appears to be a well, but the region of implantation is not defined. (See Yuki, Figure 1, column 5, lines 7-10.) Also, Yuki does not appear to teach using enhancement or field implants.

That one mask may be used for a field implant, well implant, and enhancement implant is shown in Figure 4 of the pending application, and described in the specification, for example on page 7, lines 15-18. Figure 4, as amended, illustrates a mask region 410 which dictates the location of the well implant 140, enhancement implant 130, and field implant 120. One skilled in the art would appreciate that the well implant 140 and enhancement implant 130 are implanted throughout the mask region 410. The enhancement implant is only shown in the channel region 135 where its relative number of impurities are not outnumbered by impurities in the source/drain region. Similarly one skilled in the art would appreciate that the field implant is blocked by the mask region 410, and implanted throughout the region not covered by mask region 410. Also, one skilled in the art will appreciate that the energy level and type of dopants used will depend on the exact process used to manufacture a transistor in accordance with the claim.

For at least these reasons, claim 27 should be allowed.

(Please note that upon further review, applicant's undersigned representative believes that certain statements made earlier in prosecution, particularly in the response filed February 21, 2002, at page 4, third paragraph, contain inaccuracies that have been corrected here. Specifically, the statement "Where field implant is not slowed by the isolation regions, that is between the isolation regions, the field implant is relatively deep and is not shown" is inaccurate. Again, one skilled in the art would appreciate that the field implant is blocked in the mask region 410, and implanted elsewhere. A similar statement appears in the response dated July 2001, in the first full sentence of page 5. Also, the statement "Also, since the enhancement implant is blocked by the isolation region 150, even though the enhancement implant uses the p-well mask, the implant is only shown in the channel area" is inaccurate. Again, one skilled in the art would

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

appreciate that the enhancement implant is implanted in the mask region 410 and blocked elsewhere.)

Claim 35

Claim 35 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. in view of Sanchez. But the combination of these references do not show or suggest each and every element of this claim. For example, claim 35 recites: "diffusing the first and second pocket implants laterally causing the first pocket implant to merge with the second pocket implant." The cited reference do not provide this feature.

The office action cites Sanchez, column 7, lines 40-45 as showing this element. (See pending office action, page 5, item 6, second paragraph.) But Sanchez states in the next line that lateral diffusion "is minimized, however, by the use of lower temperatures and shorter process times in the remainder of the process." Accordingly, Sanchez does not show or suggest merging pocket implants by lateral diffusion, rather Sanchez teaches that this lateral diffusion should be limited. Thus, Sanchez teaches away from using a lateral diffusion to cause the first pocket implant to merge with the second pocket implant.

For at least this reason, claim 35 should be allowed.

Claim 38

Claim 38 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. in view of Sanchez. But the combination of these references do not show or suggest each and every element of this claim. For example, claim 38 as amended recites: "adjusting a threshold voltage of the transistor by diffusing the first and second pocket implants laterally." The cited references do not provide this feature.

Again, Sanchez teaches how to limit lateral diffusion. Accordingly, Sanchez does not teach adjusting a threshold voltage with lateral diffusion as required by the claim. Kao et al. do not appear to add anything on this subject.

For at least this reason, claim 38 should be allowed.

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

27 as amended recites: "wherein the implanting the field implant, the well implant, and the enhancement implant are done using a single mask." Yuki does not provide this feature.

Rather, Yuki does not define the boundary of the well. For example, Figure 1A shows a Boron implant that appears to be a well, but the region of implantation is not defined. (See Yuki, Figure 1, column 5, lines 7-10.) Also, Yuki does not appear to teach using enhancement or field implants.

That one mask may be used for a field implant, well implant, and enhancement implant is shown in Figure 4 of the pending application, and described in the specification, for example on page 7, lines 15-18. Figure 4, as amended, illustrates a mask region 410 which dictates the location of the well implant 140, enhancement implant 130, and field implant 120. One skilled in the art would appreciate that the well implant 140 and enhancement implant 130 are implanted throughout the mask region 410. The enhancement implant is only shown in the channel region 135 where its relative number of impurities are not outnumbered by impurities in the source/drain region. Similarly one skilled in the art would appreciate that the field implant is blocked by the mask region 410, and implanted throughout the region not covered by mask region 410. Also, one skilled in the art will appreciate that the energy level and type of dopants used will depend on the exact process used to manufacture a transistor in accordance with the claim.

For at least these reasons, claim 27 should be allowed.

(Please note that upon further review, applicant's undersigned representative believes that certain statements made earlier in prosecution, particularly in the response filed February 21, 2002, at page 4, third paragraph, contain inaccuracies that have been corrected here. Specifically, the statement "Where field implant is not slowed by the isolation regions, that is between the isolation regions, the field implant is relatively deep and is not shown" is inaccurate. Again, one skilled in the art would appreciate that the field implant is blocked in the mask region 410, and implanted elsewhere. A similar statement appears in the response dated July 2001, in the first full sentence of page 5. Also, the statement "Also, since the enhancement implant is blocked by the isolation region 150, even though the enhancement implant uses the p-well mask, the implant is only shown in the channel area" is inaccurate. Again, one skilled in the art would

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

appreciate that the enhancement implant is implanted in the mask region 410 and blocked elsewhere.)

Claim 35

Claim 35 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. in view of Sanchez. But the combination of these references do not show or suggest each and every element of this claim. For example, claim 35 recites: "diffusing the first and second pocket implants laterally causing the first pocket implant to merge with the second pocket implant." The cited reference do not provide this feature.

The office action cites Sanchez, column 7, lines 40-45 as showing this element. (See pending office action, page 5, item 6, second paragraph.) But Sanchez states in the next line that lateral diffusion "is minimized, however, by the use of lower temperatures and shorter process times in the remainder of the process." Accordingly, Sanchez does not show or suggest merging pocket implants by lateral diffusion, rather Sanchez teaches that this lateral diffusion should be limited. Thus, Sanchez teaches away from using a lateral diffusion to cause the first pocket implant to merge with the second pocket implant.

For at least this reason, claim 35 should be allowed.

Claim 38

Claim 38 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. in view of Sanchez. But the combination of these references do not show or suggest each and every element of this claim. For example, claim 38 as amended recites: "adjusting a threshold voltage of the transistor by diffusing the first and second pocket implants laterally." The cited references do not provide this feature.

Again, Sanchez teaches how to limit lateral diffusion. Accordingly, Sanchez does not teach adjusting a threshold voltage with lateral diffusion as required by the claim. Kao et al. do not appear to add anything on this subject.

For at least this reason, claim 38 should be allowed.

Application number 09/606,252  
Amendment dated June 11, 2003  
Reply to final office action

PATENT

Other claims

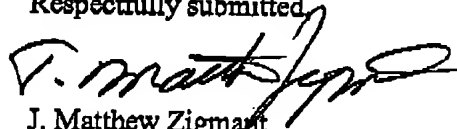
Claim 42 should be allowed for similar reasons as claim 38. The other claims depend on these independent claims, and should be allowed for at least the same reasons as their base claims, and for the additional limitations they recite.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal notice of allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-752-2456.

Respectfully submitted,

  
J. Matthew Zigmant  
Reg. No. 44,005

TOWNSEND and TOWNSEND and CREW LLP  
Two Embarcadero Center, 8<sup>th</sup> Floor  
San Francisco, California 94111-3834  
Tel: 650-326-2400  
Fax: 415-576-0300  
JMZ:jmz  
PA 3309918 v1